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LIV.—*On the natural affinities of the Lepidosiren; and on the differing opinions of Mr. Owen and M. Bischoff with regard to them.* By M. MILNE EDWARDS*.

WHEN Zoology is only studied in systematic works, it is often supposed that each class, each family and each genus, present to us boundaries precisely defined, and that there can be no uncertainty as to the place to be assigned in a natural classification to every animal, the organization of which is sufficiently known; but when we study this science from nature herself, we are soon convinced of the contrary, and we sometimes see the transition from one plan of structure to an entirely different scheme of organization take place by degrees so completely shaded one into the other, that it becomes very difficult to trace the line of demarcation between the groups thus connected. The inferior animals present many examples of such gradations; and now comes the *Lepidosiren* to unite, in the same manner, two classes of vertebrate animals, which, till now, had been supposed to be separated by perfectly clear limits. We have, in fact, seen that in certain respects this singular animal resembles Fish, whilst, by other characters equally drawn from its organization, it does not differ from Reptiles.

This mixture of the ichthyological type and of the herpetological type is indeed so complete, that the two naturalists who have best studied the structure of the *Lepidosiren* disagree as to the intimate nature of this animal. In one of our preceding numbers our readers have seen the analysis of Mr. Owen's labours, and the reasons which induced this skilful anatomist to believe that the *Lepidosiren* was to be regarded as a Fish †; whilst from another equally accurate investigation by M. Bischoff, a translation of which ‡ has been given in the *Annales des Sciences Naturelles*, the author draws the

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conclusion that this same *Lepidosiren* is a Reptile. This difference of opinion admits of an easy explanation from the abnormal character of this animal, but proves the want of new arguments, such as may turn the scale on one side or other. I thought, consequently, that it would be useful to examine anew the anatomical structure of the *Lepidosiren*; and as the Museum of the Jardin du Roi possesses a fine specimen, I begged M. Bibron, assistant naturalist in this establishment, to have the kindness to make a dissection of it; he has most obligingly done so, and has thus ascertained the accuracy of the descriptions given by M. Bischoff.

One of the reasons upon which Mr. Owen most insists for placing the *Lepidosiren* amongst Fish, is the want of communication between the nasal cavity and the mouth; but M. Bischoff asserts, that in the species which he dissected there exist hinder-nostrils (arrière-narines) opening into the cavity of the mouth near to the commissure of the lips. I also saw these posterior openings of the nasal cavity in the *Lepidosiren paradoxa* dissected by M. Bibron, and their abnormal position appears to be in part explained by the absence of superior maxillary bones. M. Bibron has also satisfied himself of the existence of the two auricles of the heart, described by M. Bischoff, so that in this important respect the *Lepidosiren* stands remote from Fish, and approaches nearer to most Reptiles. Lastly, he compared the structure of the pulmonary sacs of the *Lepidosiren* with that of the natatory bladder of *Lepisosteus* and *Amia*, and he observed that in the former this organ completely resembles the lungs of several Reptiles; whilst in the two fish which we have just mentioned, the cells of the natatory bladder are much less compressed, less regular, and apparently less vascular. One of the lungs, that on the right side, stretches almost the whole length of the abdomen; but the other is much shorter, a disposition which is very common among the Reptiles. We should remark, that it is also the right lung which is greatly developed in the Ophidians, whilst the left lung remains more or less rudimentary.

This difference of structure between the pulmonary pouches of the *Lepidosiren* and the air-bladder of *Lepisosteus* and *Amia*, would certainly not suffice to negative the analogy which Mr. Owen allows between these organs, and to draw from the presence of the former in the *Lepidosiren* a peremptory argument in favour of the herpetological character of this animal; but there is another consideration which appears not yet to have struck zoologists, and which I think should have some weight in this discussion. The lungs of Mammalia, of Birds and of Reptiles, as every one

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knows, always originate from the *ventral face* of the digestive tube, whatever their position may be in the splanchnic cavity, and it is always on the ventral side of the pharynx that the opening of the glottis is found; it is the same with the *Lepidosiren*; and if the resemblance between the lungs of all these animals and the air-bladder of the *Lepisosteus* and of the *Amia* was as great as Mr. Owen seems to think it is, we ought to find this same character of organic relationship between the œsophagus and the bladder of these fish. Now it is quite the contrary, for the kind of pseudo-glottis which establishes the communication between this cellular pouch and the digestive tube originates from the *dorsal face* of the œsophagus. There exists then a fundamental anatomical difference between these parts, whatever else may be their physiological functions, and this difference furnishes a fresh argument in favour of the opinion of those who consider the *Lepidosiren* as a Reptile.

I shall also add, that in the *Lepidosiren paradoxa* the abdominal viscera which, for the most part, were wanting in the individuals dissected by M. Bischoff, greatly resembled those of the *Lepidosiren annectens*, whose structure Mr. Owen has made known. M. Bibron and myself have sought there in vain for the traces of a pancreas and of a spleen, and the spiral valve of the intestine appeared to us to be still more developed than in the *Lepidosiren annectens*.

LV.—*Information respecting Zoological and Botanical Travellers.*

THE expedition under Mr. Schomburgk, appointed at the expense of Government, to survey the boundaries of British Guiana, has sailed for Demerara. Messrs. Glascott, R.N., and Mr. Walton accompany it, the first as assistant-surveyor, the latter as artist; but unless we are misinformed, there is no naturalist or collector on the part of this country,—Mr. Richard Schomburgk, brother to the director of the expedition, going out as a naturalist at the expense of the Prussian government and by permission; and thus we fear that the whole fruits, so far as natural history is concerned, of an expedition carried into a rich and partly unknown country at British expense and under British protection, will be carried off to a foreign kingdom, for the want of a person to attend exclusively to that branch, and who could have accompanied the party at comparatively small expense, and under circumstances of advantage of which others have known how to avail themselves. *There is time still to remedy this.*

The “Niger expedition” will also sail in a short time. One of the commanders is already known to be an excellent draughtsman, and

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